

DESIGN THROUGH METAPHOR



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# ABSTRACT

In recent design domain, products are required to provide pleasurable user experience beyond the aesthetic form, function and usability. Metaphors can be an effective tool for designers to fulfill this requirement by understanding the relationship between user and product. Metaphor expresses an unfamiliar concept in terms of a familiar concept. As a communication method, metaphors provide a strong emotional attachment between user and product, because metaphor is our fundamental way of thinking to perceive and interpret things. This study aims to discover how metaphoric expressions play a role in the design domain and to provide designers with perspectives about how to apply it in the design process. It can help designers to deliver meaningful products to users encouraging them to interact with products.

This study is progressed in two different parts; the theory and the case study. The theory part defines metaphoric expressions in design with comparison of the verbal use of metaphors. The use of metaphoric expressions is shown from different design approaches as well. Various attributes of metaphors are defined with how these help designers and users. Designer's intention, user's context and subtlety are introduced as elements to consist metaphors in design. Finally,

the study with examples from products illustrates that metaphor's value and effectiveness which enhance meaningfulness of products. Findings show that how metaphor is applied in the design process and what metaphor can contribute for designers and users.

In the case study part, findings from theoretical study are applied to the actual product design process; smartphone protection cover design. This practice aims to employ metaphors in the actual design process to share the practical process and experience with the evaluation of the outcome. With the project, two different user studies are performed to define user's context and to evaluate the outcome.

This study demonstrates that metaphors perform an important role in the design process, and can be a powerful and effective tool for designers to approach a design practice with new perspectives. On the other hand, metaphors become a familiar source for users to understand products and it can provide them with meaningfulness when they experience the design.

**Keywords** - Metaphors, Relationship, Meaningfulness, Product design, Interaction, User experience.



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# INTRODUCTION

## Motivation

From my experiences of design practices and study, I have considered that 'idea' is the most important attribute in the design process. All the design process is mainly focusing on finding the solution, the idea. However, how to approach the design and from where designers can conceive the idea were not clearly defined for myself. All those processes were not coherent and so irregular even in the design process of the company. There are many design methodologies and studies were introduced to help designers to search required and qualified information, and to analyse it practically. However, most of them are limited to supporting on collecting and analysing information. Understanding of design radically behind the relationship between artifacts and

humans should take precedence in the design process.

Once I told a friend of my working experience as a designer in Korea. I described the experience of a heavy load of work in a short time. I told that the design results were replaced quickly by new designs and this made me feel like becoming a chef who makes only fast food. My friend said that he can fully understand the feeling and empathy for the situation because of the metaphor expressing myself as a chef and the design work as cooking. From that experience, I realized that we think and use metaphors unconsciously when we want to express something meaningfully and to deliver it effectively. It also helps the audience to understand

the meaning and to grow empathy for it.

There are many studies and investigations about metaphors in design, but they lack of showing how it is applied in the actual design practice and how the outcome is experienced by users. Thus, from this thesis, I want to study metaphors in design not only through theoretical practice, but also through the real product design and development practice.

## Focus and aim of this study

Metaphor plays an important role in our communication. Many things around our daily lives are constituted in metaphors because metaphor is not just a language but actually a thought. Communication is fundamental in design domain these days. Metaphor can provide designers with an effective and powerful perspective. Especially in the user interface design, metaphor is already prevalent and essential. It has been applied to many cases concerning important jobs, because metaphor brings interaction between products and users by assisting our thinking ability; relation, reason, understanding and imagination. It is also applicable to other design areas and can be a powerful tool not only for designers, but also for users to understand products.

This thesis aims to show how metaphor can be applied to the design process and how it can contribute for both designer and user. It consists of two main parts; The Theory and The Case study. In the theory part, metaphoric expressions in design will be defined through existing studies and design approaches with its attributes in design according to the relation of designer and user. In addition, studying examples from companies will be added to provide clear and tangible clues for understanding the value and effectiveness of metaphors in design.

In the case study part, findings from theoretical study will be applied to the actual product design process

to share the evaluation of the outcome of the thesis. The design practice will be progressed in the field of designer's perspective and position, aiming to provide concepts of how metaphors can be helpful to approach a design process.



Figure 1. X-ray of light bulb with 'idea' (Photographer: Nicholas Veasey)





# Part I: The theory

Studying the design process with metaphoric  
expressions



# 1. Metaphor and Design

## 1.1. Figurative expressions: Metaphor and Simile

Metaphor is a figurative expression. To understand the concept, quoting some definition may be useful for the reader. These definitions are as follow:

*“In traditional analysis, words in figurative expressions connote additional layers of meaning, while words in literal expressions denote what they mean according to common or dictionary usage. When the human ear or eye receives the message, the mind must interpret the data to convert it into meaning. What are Figuratives? On many occasions, the words may not convey the literal meaning of them. They may convey the indi-*

*rect meanings which may be just the opposite to their literal meanings. Such symbolical and metaphorical meanings are called Figuratives. They contain the figure of speech”*

*(English for Students. [Online].)*

Figurative expression is divided into metaphor and simile. The Oxford dictionary states “metaphor is a figure of speech in which a word or phrase is applied to an object or action to which it is not literally applicable (oxforddictionaries.com, 2012)”. The dictionary states also “simile is a figure of speech involving the compari-

son of one thing with another thing of a different kind, used to make a description more emphatic or vivid (oxforddictionaries.com, 2012)”. Although metaphor and simile are very close by using the comparison, these two expressions are different in literary. The difference between them is only in degree of stylistic refinement (Read, 1955). There is a simple way of making distinction between them. A simile compares two things with using the word ‘like’ or ‘as’, while a metaphor compares two things without using the word ‘like’ or ‘as’.

*Simile: My father grumbles like a bear in the mornings.*

*Metaphor: My father is a bear in the mornings’.*

*(English Language Arts Skills & Strategies, Saddleback, 2005)*

The comparison between those expressions would be worthwhile in the literary study. However, this thesis does not intend to study about the comparison, but rather aims to study how the same figure of those expressions are used in the design world and how it can contribute to various design processes. In addition, most people consider those figurative expressions as a metaphor. Therefore, these two figurative expressions will be defined and considered just as ‘metaphor’ in this study.

## 1.2. Definition of Metaphor in Design

A metaphor expresses things unfamiliar in terms of things familiar. When we talk about something abstract, we often use metaphors to explain it clearly and easily (Lakoff, & Johnson, 1980).

*“Metaphor is a device for seeing something in terms of something else. It brings out the thisness of a that, or the thatness of a this.” (Burke, 1945)*

Metaphor is a literary figure of speech that uses images, stories or tangible things to represent less tangible things or some intangible qualities or ideas. For exam-

ple, “Hope is a ray of light”, in the expression intangible property of ‘hope’, which is the target, becomes clearly defined by tangible quality of ‘a ray of light’, the source. The ‘cross-domain mapping’ between the target and the source is the core of metaphoric expressions (Figure 2). This function allows metaphors also to be used for any rhetorical figures of speech that achieve their effectiveness and persuasiveness via association, comparison or resemblance. This verbal use of metaphors is a very effective skill in communication because it does not only provide better understanding but it can also form a powerful emotional attachment

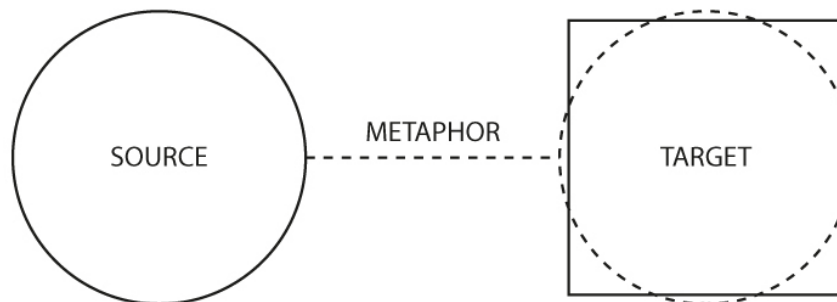


Figure 2. A model of cross-domain mapping (Wulff et al, 1990).

between the audience and the intended meaning of the subject.

This advantage in metaphors is not only used in verbal communication but also applied in non-verbal communication, especially in the design domain, from products, graphics and UI (User Interface) to services. Designers communicate with users through products, and design is the mean of communication for them. As metaphor has a role in communication, design engages also the cross-mapping process between the idea (the source) and the product (the target). Knowing and applying this in the design process, metaphors can provide designers with intuition and inspiration to trigger their imagination. It can also deliver better understanding to users when they experience the product since the embedded metaphor makes the product familiar to them. Consequently, when metaphors are applied in design, designers can provide familiar and meaningful products to users (Hekkert & Cila, 2009).



Figure 3. Top of lungs  
(Photographer: Photo by Ira Heuvelman-Dobrolyubova)

## 2. Metaphorical approaches in Design

The use of metaphor is fundamental in design. Metaphorical expressions are broadly applied in design domain and its attributions can be seen in many design approaches. There is a basic framework on 'product metaphors' (Figure 4) introduced by Nazli Cila and Paul Hekkert (2009). This framework shows in detail how metaphors work in the design process. It adopts products as a communication medium between designer and user as common design approaches to explain the relation between them, explaining how they are related through the design process. According to the framework, metaphors in the design process are generated by the interplay between intentions of designers and experience of users. Designer's intentions for

applying product metaphors can be classified in several figures such as identification, use/ operation, symbolic/ figurative meaning, ideology/ ethics/ morality/ message and fun/ wit (Figure 4). User's context is composed of his or her knowledge, experience, culture, expectations, beliefs, etc (Hekkert & Cila, 2009). Designers should understand the user's context how he or she will experience the product in order to deliver their intention properly by mapping the product with the optimal metaphor. Experience is composed of four elements; observations, thoughts, feelings and wants (Bushe, 2009). In order to bring the level of pleasurable experience to users, products should have an element that inspires them to interact; to look, think, feel

and desire. The implied metaphor generated in user's context, is likely to attract the user and trigger the interaction between the user and the product.

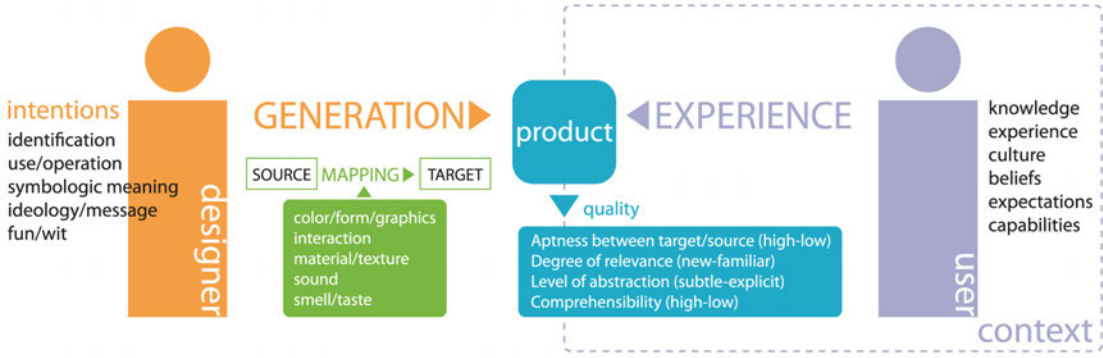


Figure 4. The basic framework on 'product metaphors' (Hekkert & Cila, 2009).



## 2.1. Semiotics in design

The similar approach is found in the study of design semiotics, as it is much broader domain which contains metaphor in its context (Figure 5). In its simplest form, semiotics can be described as the study of signs. All the signs stand for something else which are separate meanings from its literal meanings, and the meanings are interpreted by people (Hjelm, 2002). This is why design is considered as a process of meaning creation in terms of this study (Karjalainen, 2010). When designing, designers are supposed to intend such things as what the product looks like, how it is used by users or what value it can deliver to them. These designers' intentions always come with regard to concerning consumers who purchase and use them. Because when experienced all the products comes into the interpretation procedure by users simultaneously. A certain sign may represent different meanings in different cultures and countries. Similar to this, a certain product can be considered and accepted differently depending on different users. Scissors, for example, are normally considered as a tool for cutting various thin materials, such as paper, cardboard, metal foil, cloth, rope, and wire. However in Korea they are also used on the dining table for cutting food, and it is common to see that serving dishes with scissors in many Korean restaurants. Many foreigners say that it is awkward to see scissors on the dining table since they only use kitchen

scissors for cooking. For this reason, most Korean restaurants abroad serve food after cutting already in the kitchen.

Therefore, studying and understanding users' context is also the key element in design semiotic approaches. To create meaningful products for users and to implant the designer's intention properly in it, designers must understand the relationships between the signs, what they stand for and the people who interpret them – the users we design for (Hodge, 2003).

Design does not only mean about artifacts anymore, but also includes its brand, marketing and service. All these values come together and are experienced by users, and become a meaning. Nowadays, companies try to construct firmly their own image, the meaning of their brand that all their products share and represent to customers. Therefore, the brand strategy and product design should be established in the product character equally through the designer's intention and the user's perception with interpretation (Karjalainen, 2010).

Thus in common, design process, which creates meanings in products, is attributed by designers and users together. These approaches can provide designers

with a new perspective to see the design process in a holistic view and let them make products meaningful by creating the interaction between users and products (Vihma, 1995).

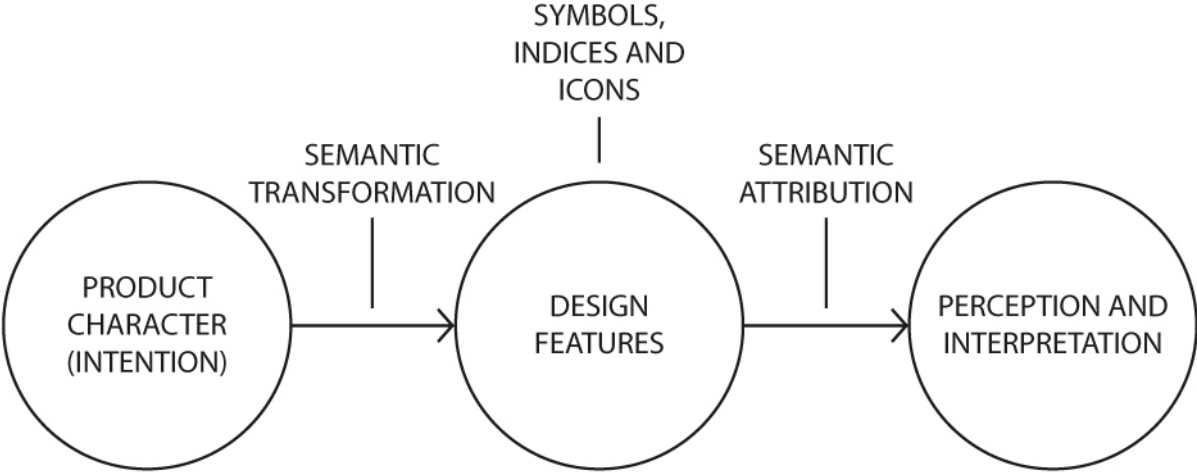


Figure 5. The processes of meaning creation (Karjalainen, 2010).

## 2.2. Anthropomorphic design

Anthropomorphism is around us everywhere we look, from the talking animals in children's books to the finger pointer on the computer screen. For a gainful definition, one may refer back to the book from 18C:

*"There is an universal tendency among mankind to conceive all beings like themselves, and to transfer to every object, those qualities, with which they are familiarly acquainted, and of which they are intimately conscious. We find human faces in the moon, armies in the clouds." (Hume, 1757)*

We often interact with objects as if they were human. For instance, when the computer does not work well, we often complain and describe it as 'stupid' or 'moron', while we call them 'smart' in the opposite situation.

*"Recent developments in cognitive linguistics have revealed how abstract meaning in language is shaped by bodily experience. We understand and express such concepts as time, causation, direction or love through metaphors that are shaped out of our sense of ourselves as embodied creatures." (Holme, 2001)*

Anthropomorphic design is used to describe the ap-

pearance of something non-human such as inanimate objects, animals, or natural phenomena in relation to its resemblance to the human characteristics or behavioral aspects. For example, the lamp 'Anglepoise' (Figure 6), designed by George Garwardine in 1935, is composed with the shade which resembles a head and the jointed base which looks like a human body. George Garwardine was inspired by the human arm and the muscle tension for springs between joints (Design Museum, 2006). The lamp design inspired again for Pixar Jr. (Figure 7) which is described as a living character in Pixar's first three-dimensional computer animated film. We have an innate tendency to personify non-human things. It helps us to recognize the objects easily and quickly like where is the top, the bottom, the front, the back and the sides of the objects. Then it becomes easy to describe to others as well by using words that are applicable to the human body. This factor is directly connected to the usability, the ease of use and learnability of a human-made object.

When an object holds human characteristics, it becomes relatable and familiar for human. Applying anthropomorphism to the design, designers can create the product to invoke the feeling that we feel from human being among users. Ultimately, the persona

designers create interacts with users through the product. Thus, through applying anthropomorphism in design, it is natural to bring user experience in the product. Anthropomorphic design for products does not only mean in terms of how they look, but from an entire set of experiences users acquire when they interact with products. In that sense, anthropomorphic

form in products requires users' cognitive response to the products, as well as the designer's intention.

Anthropomorphic design is also a metaphoric expression according to the attribution that creates the interaction between users and products through describing the unfamiliar by the familiar; human characteristics.



Figure 6. Anglepoise 1227 (Designer: George Carwardine)



Figure 7. Pixar Luxo Jr. (Director: John Lasseter)

## 2.3. Affordance design

*“The object offers what it does because it is what it is.”  
(James. J. Gibson, 1979)*

Affordance was originally introduced by a psychologist James J. Gibson in his article “The Theory of Affordances”. It deals with all ‘action possibilities’ that is latent in the environment. For instance, a knob affords twisting, and perhaps pushing, while a cord affords pulling. Applying affordance in design, an object does not only have a single functionality but offers many possible values through its form and environment. Chair functions mainly for sitting but it can provide other values such as hanging a jacket on the back, leaning against when you are standing or stepping on top of the seat. Those possible actions are the chairs’ affordance. It means that an object has several action possibilities so that people can perceive it through its form and environment. Also the perception and action of the affordance closely relates and depends on the audience’s context; character, experience, requirement and cultural conventions. To trigger and bring consumers’ action, designers must be aware and consider of their latent behaviors and unconscious requirements from their context as well as the profound understanding about the product and service.

Affordance design is not completed with the visual form of the product, but only when it is connected to the user’s perception and action. Therefore, designers should consider the consumers’ action possibilities in terms of their social and cultural background.

*“There was a particular moment when I realized that design reconciles people, objects and environments, that design is not just about creating shapes but also about relationships.”  
(Naoto Fukasawa)*

An illustrative example of affordance design can be seen in a well-known industrial designer, Naoto Fukasawa’s design works. He believes that “Without thought” is a great way to look at objects and it is a mantra for his design. One of his design works, the wall-mounted CD player for MUJI (Figure 8) looks like a kitchen fan. It is also applied with affordance design. With the speakers embedded in it, the CD player has a single cord dangling from the bottom that beckons the user to pull it down. The operational instructions are latent in the form through a natural relationship between object and user. When pulling the cord (the switch), the CD spins and the music plays (Ashcraft, 2007). This operational behavior comes naturally;

when the user sees the CD player on the wall with a dangling cord, since the cord that reminds the user of a kitchen fan on the wall and pulling the dangling string down. The function of kitchen fan, providing the fresh air is the metaphor of the function of the CD player, playing the music. Through the metaphoric expression in the affordance design, the user perceives the product naturally “without thought”, since the embedded relationship enhances the means of interaction between the user and the product.



Figure 8. MUJI CD player  
(Designer: Naoto Fukasawa)

### 3. Attributions of Metaphor in Design

In everyday speaking, words are very commonly used metaphorically. Using metaphor is so embedded in our daily language that we do not even recognize it. Metaphor is central in the human communication and thought, so that many things human creates are constructed upon it (Lakoff & Johnson, 1980). Metaphors are used to express our understanding or our interpretation of the world around us as clearly as possible. Therefore, metaphor is a powerful tool for understanding our world and an effective source for enhancing communicative power, meaningfulness.

#### **Four attributions for designers and users; Reference, Cognitive, Rhetorical, Correlation**

Metaphors become a **reference** for designers to find ideas, and for users to understand products because metaphor is **correlated** between what designers look for and what users understand. Therefore, metaphors become a **cognitive** source for users to understand products. In addition, metaphors also become a **rhetorical** tool for designers to describe products.

- For designers

*"The medium is the message" (McLuhan, 1964).*

Designers communicate with users through his or her design. Their way of expression in design is the medium and it becomes the message to users. The kind of medium, designers choose ,affects the content of the message. (Hjelm, 2002)

Metaphor is an effective medium to describe meanings and emotions in communication. When authors write, they often adopt metaphors in their expressions in order to describe the events or things delicately and to maximize the emotional attachment for the audiences. Adopting metaphoric expressions in design, designers can also leverage the attraction and meaningfulness of products through creating an emotional attachment between users and products.

To deliver the message with intended meaning correctly, designers are required to choose the right medium and must be aware of how it can be perceived and experienced by users. Understanding metaphoric expressions can provide designers with this perspective. Metaphors can contribute on designers to bring new ways of thinking and understanding about a product and new solutions to a design problem (Bushe, 2009). They can further be able to express the perceptive character of products as the intended its character.

- For users

The medium, through which content is carried, plays a vital role in the way it is perceived. Metaphors contribute a way of thinking, offering the audiences fresh ways of examining ideas and viewing the world. The main purpose of using metaphors in communication is to convey the deeper and clearer understanding about the context to the audiences. It allows them to approach the target from a different direction so which provides a new perspective on it (Erickson, 1990).

As a communication in design, metaphors play a role as the reference that makes a relationship between the designer's intention about the product attributes and the user's contexts. It helps the user to understand and approach the product in many different layers in relation to their experience, knowledge and background.

*"A good metaphor is essential to an easy-to-use human interface." (Erickson, 1990)*

Therefore, without tedious instructions the user can approach the product easily through the embedded sources that interact and create empathy for. The product, then, becomes a meaningful object for them. As mentioned before, this can be discussed under the title of four attributions.



### 3.1. Reference

*“Metaphors serve as natural models; they allow us to take our knowledge of familiar objects and events and use it to give structure to abstract, less well understood concepts.”*  
(Erickson, 1990)

Creativity is a unique figure of human behavior, but the creation in human activities does not mean ‘making a totally new’. Creating a new idea is making relation between ideas by juxtaposition or recombination (Hallman, 1963; Koestler, 1964). When we do ideation, we always have the common process that lists related information and analyze their relations and differences. Then we find new solutions from the process. This is why we usually say ‘I got the idea from somewhere’ not ‘I made the idea’. There are many famous architectural objects and artifacts that are inspired by something else, mostly by nature. Then these artifacts inspire other artifacts and other creative activities again. These creative activities can be seen in terms of ‘Design’. The inspiration becomes references for designers and designers create so-called new solutions referencing other existing solutions.

Metaphors are a figure of speech that describes a concept via related attributes as the reference for audiences. The author can address what he or she wants to

deliver with various expressions and meanings through the references. Applying to design, metaphoric thinking and expressions with the references, related to the subject, can help designers to perceive what they want to express through the product and what sources they need for that. Spontaneously, it helps them to find reasonable ideas and to effectively express them through design. Metaphoric expressions can become a source of inspiration, so designers can extend their way of thinking and imagination with their common and reasonable knowledge, derived from experiences, just as metaphoric expressions do.

### 3.2. Cognitive (informative)

Products should clearly communicate their function for users to be able to use unmistakably and easily. Preferably, users should not need a manual to use simple products. They are recommended to be recognizable by showing how it works, functions and operates through their form. Such products can be simply used without thought.

When we explain or introduce something new, we often mention its definition and add related examples. We refer to those examples for supporting and emphasizing our ideas, opinions or insinuations, especially for unverified ideas.

A good expression of meaning relies on the references that are understood. As mentioned above, the main function of metaphors is the role of references that support the meanings to be clear and understandable. Thus, the references are likely to be more concrete and tangible than the target (intangible or less tangible quality and idea) to whom the author originally wants to deliver.

Metaphors become informative attributes in products as well. Since one of the main applications of metaphors is to employ the familiar to explore the unfamiliar, consequently one of the main reasons to ap-

ply metaphors in design becomes its effectiveness to introduce new concepts to users. Intangible concepts of products can be transformed into concrete and cognitive forms through the metaphor's function which conveys the source. Then, users can easily understand and feel the products familiar from their knowledge and experience. Applying metaphors in design, the embedded source can be the visual clue that indicates an emphasis on the required operations or the intended functions of a product.

### 3.3. Rhetorical

*"The moon was a ghostly galleon tossed upon cloudy seas". (The Highwayman, Alfred Noyes)*

*"My love is like a red, red rose". (Robert Burns)*

In communication, an important role of metaphors is a rhetorical device that decorates the expression by adding layers of meanings to a word (target) from the sense or aspects of another word (source). It helps the author to make the expression affluent as well as convincing and attractive to audiences. For example, an expression, 'her lip is red like a cherry' or 'her lip is a cherry' must be more interesting and meaningful for audiences than the expression, 'her lip is red'.

This rhetorical function of metaphors is applicable to design as well. Employing sources as references which have indirect forms and meanings can inspire consumers and enable designers to create more meaningful products. Those sources are applicable not only in the form of aesthetical expression, but also in products' function and usability. Without the rhetorical figures a product is just a tool which cannot inspire users to empathize and interact (Jordan, 2000). Certainly, there should be a product which is better to remain as a pure tool. However, products are not only focused on consumer's functional needs, but on their many other requirements. Oxford dictionary defines it as "an ar-

ticle or substance that is manufactured or refined for sale" (oxforddictionaries.com, 2012). It also defines a tool as "a device or implement, especially one held in the hand, used to carry out a particular function" (oxforddictionaries.com, 2012). Therefore, products should apply consumers' needs and requirements, and designers are required to gain further insight from consumers' latent requirements that they do not even notice yet.

The rhetorical figure of metaphor can bring more significations in users' perception process. With responding to the added layer of meanings, users spontaneously interpret the relative meanings between target and source. By adding the signification process through metaphor, designers can enhance meaningfulness of a product and create the emotional attachment into the product that the user can experience and interact with.

### 3.4. Correlation

Both our thoughts and acts are correlated through metaphorical thinking in terms of our ordinary conceptual system (Lakoff & Johnson, 1980). The central of metaphorical system in communication is based on the correlation. In metaphorical expressions, the target is described with the related quality from the shared idea, which is the source, between the author and the audience. When we perceive something new we try to interpret it, comparing to the related information. For instance, we often describe new object as 'it looks like something' or 'it feels like something'. It helps audiences to visualize and understand what it is like.

Designers need to understand metaphors and proceeds metaphoric thinking in ideation to achieve the correlation in design. As it is the same in literal and verbal communications, the form, function and usability of products should be related to each other in order to achieve users' understanding. To achieve this, design should be expressed with the related quality to the subject and the idea that is shared between the designer and the user. In the design process, designers' role as the author is to describe the product to consumers, the audience. Embedding the shared idea, which is related to the form, function and usability

into the product, will be more cognitive and meaningful for consumers. Then it may become a source that is able to touch users' emotion as well. Through the embedded layer of meanings, users spontaneously interpret the relative meaning between the target and source. For example, Ty Nant's water bottle (Figure 9) designed by Ross Lovegrove, which reminds the fluidity of water employed the form of running water. The form of fluidity evokes freshness and purity from consumers. That evocation strongly relates to the water inside of the bottle (function). Consumers may drink water from ordinary bottles without any particular perception or inspiration, but with Ty Nant's water bottle they may visualize the perception of water that they previously recognized. This signification process becomes a factor that raises the interaction between the consumer and the product.



Figure 9. Ty Nant's water bottle (Designer: Ross Lovegrove)



## 4. What makes metaphor in design

### 4.1. Designer's intention

The source to describe the metaphor depends on the author's intention about what or how to deliver the subject to the audience. With metaphors, author can put stress on a certain figure of the subject or express the overall sense of the subject that he or she want to deliver to the audience. Moreover, metaphors can provide audiences with new ways of thinking about the subject.

In the design domain, metaphors enable designers to form their intention into the product. Employing metaphors, designers can emphasize what he or she wants

on the required operations or the intended functions of the product as well as on its appearance. Therefore, looking carefully on products, designer's intentions can be seen through their form, function and the way of operation. Paul Hekkert and Nazli Cila (2009) introduced the reasons for applying metaphors in products in terms of designers' intention. They sorted them into five different intentions; identification, use/operation, symbolic/figurative meaning, ideology/ethics/morality/message and fun/wit. Those designer's intentions on products can affect directly on how users perceive and experience the products.

In advertisements, metaphors are used to deliver messages to consumers effectively and strongly. In most cases, metaphors associate a target with a semantic domain which has positive connotations. For instance, in advertising running shoes, Newbalance described the shoes look like a heart as a unique and timely metaphor which appeals to the emotions of the consumer (Figure 10). With the original Spanish words “Corre con el Corazon” translating to English as “Run with the Heart,” this advertisement clearly aimed at customers who love running for the personal joy it brings them, rather than those who wish to outrace their opponents. Once again, this shoe advertisement demonstrates a simple yet clever visual metaphor that catches the eye of consumers and can be instantly understood by the target audience.

On the other hand, metaphors are not just associated with positive connotations, but they also employ negative implications to warn people. The ad campaign for the National Resources Defense Council aims to raise awareness about air pollution (Figure 11). The text reads: “Air pollution kills 60,000 people a year”. This advertisement has two metaphors. First metaphor is a smokestack that fumes out smoke to describe the air pollution. Then again the smokestack is described with the image of a gun as a metaphor to emphasize the harmfulness of air pollution to people. The negative connotation of the gun that kills people is directly

implied to the smokestack. Most people already know the truth that air pollution is harmful but many of them do not take it so serious because they cannot clearly recognize the fact without any tangible clue. With those metaphors, however, people can see and feel its danger vividly through the concrete visual expression of a smokestack and gun.

Metaphors are also able to trigger new perspectives for designers to approach a product or new solutions for design problems from the beginning of the design process. Approaching design process through understanding metaphoric system is helpful in the research phase as well as ideation and visualizing processes. Designers can focus on appropriate information through metaphoric thinking so that they can save their time and energy with searching and analyzing wrong data which is not related to their intended target.





Figure 10. New Balance - Corre con el Corazón (Run with the heart)



Figure 11. A gun beneath the smokestack  
 -Proclaiming the danger of air pollution  
 (Designer: Yi Je-seok)

## 4.2. User's context

As a communication method, design is also a sort of language, a medium between designers and users. For that reason, as well as designer's intention, user's context is an important factor defining the way of expression and direction of design. Design is basically consisted of designer's intention and user's requirement. Designers need to think about products from users' perspective and are asked to create products considering their requirement. The requirement does not only include their conscious demands, but also their unconscious needs. In order to figure out user's unconscious requirements, knowing and understanding their context should be preceded. User's context is their holistic experience which is composed with their knowledge, experience, belief, ideology, expectation and culture to where they belong.

The above factors of design are similar to metaphoric expressions. A basis of metaphoric expressions can be also derived from considering audience, the user. To deliver the designer's intention properly through the metaphor, designers should understand users' background, their holistic experience. Otherwise, misunderstanding them may cause design outcomes with incompatible or unrecognizable metaphors which can bring faults, disappointment or displeasure to users

(Cila & Hekkert, 2009). Certain design can be pleasurable for certain people but it might be unpleasant for others. If a designer describes a product with a source from the field that the user never understands, the user may not figure out what the product is or how to use it. It may lead to frustration. Employing a source from different cultures in design can mean totally different to the user from the designer's intention because different cultures have different conceptual perspectives and frameworks to perceive things.

To bring aptness between source and target, designers should be aware of the user's context in which the metaphor is being used. The aptness can lead the design to gain the user's empathy. The empathy is defined by Oxford Dictionary as "the ability to understand and share the feelings of another" (oxforddictionaries.com, 2012). How can understand and share other's feelings? The empathy comes from the experience in the same cultural background.

Meanwhile, from investigation of user's holistic experience, designers can get unexpected sources and ideas in the design process. Although the intuition of designers is sometimes more important than the information from user's context, the designers' intuition is

originated from profound understanding of users. This is the ability to view what users are not far-sighted enough to think about.

### 4.3. Subtlety in realization

Designers should be cautious about how to deal with the subtle expression when describing metaphors in design. In verbal communication, metaphors do not describe the source itself but actually its certain attributions which are related to the target. For example, according to a metaphoric expression, “Time is a thief”, time is not really stealing anything. This metaphor indicates the figure of time that passes quickly and our lives pass us by.

Applying to design, it is not a proper way to describe the source of metaphor the way it is because what designers really want to deliver to user is eventually the product, target. Therefore, designers should describe the product with the relationship and shared characters between the target and the source. The shared character must be placed at some point between the target and source, and it should be described with the subtlety or level of abstraction of a metaphor that refers to the degree of explicitness in design (Hekkert & Cila, 2009).

Dealing with subtle expression in design is a part of the visualization process. The degree of subtlety in metaphoric expression of design depends on the combination of designer’s intention and user’s context. Finding

the appropriate subtlety of metaphor relies on designer's ability. In order to find suitable degree of subtlety in metaphors, designers are required to study and understand user's context carefully with the insight into metaphoric expressions.

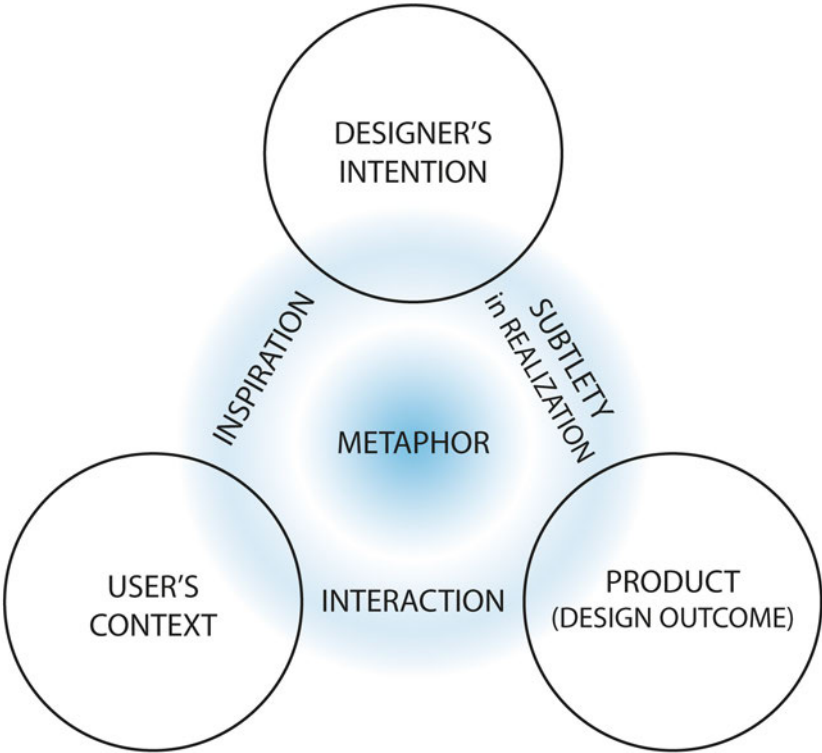


Figure 12. The processes of design through metaphor

## 5. Examples of metaphors in design

We can commonly see metaphors in the field of design. Good examples of metaphor in design can be seen through Apple Inc. Apple perhaps understands and uses the effectiveness and value of metaphors best ever. The first successful use of metaphor by Apple came with Macintosh in 1984 (Figure 13); it was the first personal computer to feature with a mouse and GUI (Graphical User Interface) rather than TUI (Text User Interface); a command line interface. Combining the GUI technology developed in Xerox PARC into Macintosh operating system, Apple introduced a new interface for users. While other existing com-

puters had a command line waiting for your order via typing on the screen, the interface of Macintosh was created with adopting the metaphor of real office environment (Zonana, 1988, Horn, 2007). Users became to communicate with the computer not through abstract textual commands but rather using a metaphorical desktop that provided icons of real life items such as folder and trash bin with that the user was already familiar. Applying the metaphor into GUI brought a great convenience for ordinary users to approach the computer easily. Before Macintosh, the user had to type its command to delete a file which was unfamiliar

to the concept of human thinking and behavior, and it limited to popularize the personal computer to ordinary people. With Macintosh GUI, however, the user can delete a file by dragging and dropping it on the icon of trash bin with a mouse. That action was much

simpler and easier than typing on the command line because it was based on our metaphoric understand which enormously contributed the usability and development of computers as well as its popularization among ordinary people.

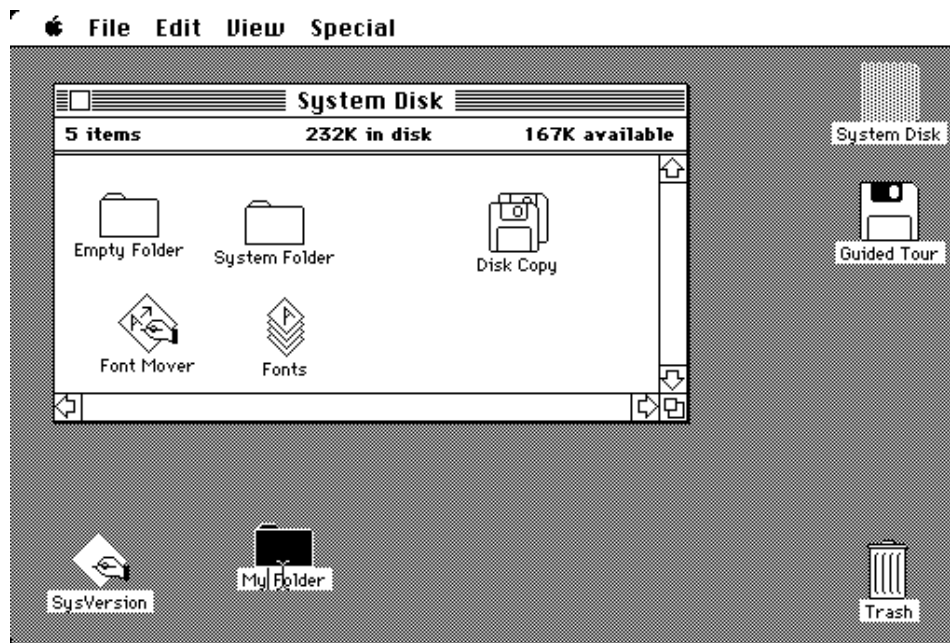


Figure 13. Macintosh GUI (APPLE, 1984)



Figure 14. Icons of APPLE applications

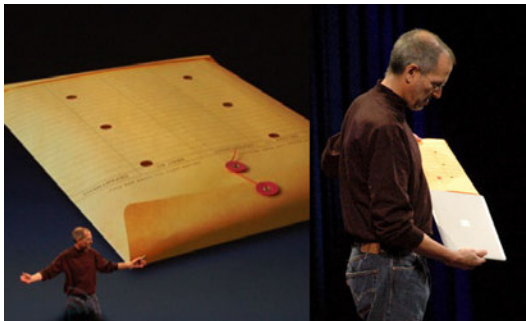


Figure 15. Steve Jobs Presentation in MacWorld 2008

Applying Metaphors by Apple have not only appeared in UI design but in their marketing, advertisements and even in the presentation for introducing new products. Apple logo, the silhouette of an apple with a bite taken out of it is a symbolic metaphor, represents 'Acquisition of knowledge'. Apple's marketing strategy and advertisements are not through denotation of hardware specs which are like abstract textual commands but rather using metaphoric images and words like their GUI with which the consumer was already familiar and can imagine from it. All their icons and names of products are metaphorically consisted (Figure 14). For example, their web browser is named as 'Safari' and its icon is formed as a compass which may describe that you are an explorer looking for animals or treasures (information). The similar uses of metaphors in such icons and names are also shown through their other applications; 'Keynote', 'Facetime' or 'iTunes'. In the presentation when introducing the first generation of Macbook air in 2008 (Figure 15), Steve Jobs pulled it out of a manila envelope, which emphasized its lightness and thinness very effectively instead of appeal with numbers. Moreover, its name, 'air' inspires people to recall its lightness and thinness. Apple already understands the effectiveness and power of metaphoric expressions to deliver meanings, while other companies are still struggling to deliver abstract numbers and technologies which cannot buy ordinary consumers' attention at all.

Metaphors in design are not only applied in visual domain but also in other sensory domains such as tactual, auditory and olfactory. A good example of such multimodal sensory metaphors is Apple, yet again, their winding a clock sound effect when one sets the alarm on iPhone recalls users' nostalgia and emotion from the sound of an old analogue clock (Figure 16). Another example is Microsoft arc touch mouse (Figure 17) which is applied with tactual and auditory metaphors. This mouse does not have a wheel for scrolling but a touch panel, that swiping your finger along the panel results in a slight vibration and soft clicking sound that creates a realistic scrolling feedback to users.

Considering these cases, metaphoric expression clearly shows that, when applying to design domain through familiar embedded idea, it can leverage the value of products by providing users with interaction and experience. Consequently, designers can have a perspective to understand how metaphoric expressions are applied in the actual design product to enhance its meaningfulness, the communicative power.



Figure 16. Alarm setting on iPhone (iOS 6.0)





Figure 17. Microsoft arc touch mouse (Designer: Young Kim)



# Part II: The Case Study

Designing product with metaphor  
smartphone protective case design



# 1. Design brief

During the study of metaphors in design, I carried out a product development project which is about smartphone accessories. The intention is to extend this case study to the degree of practice level through applying findings from the theoretical study into a real design project. As metaphors express intangible or less tangible figure in terms of tangible figure, a theoretical study can be clearly described through a practical practice and project in a tangible manner.

The reason why I chose smartphone accessories for the product development project is smartphone's

ever-increasing popularity gaining huge interest and replacing rapidly existing mobile phone models in the global market. Since smartphones have appeared in the market, new industries emerged almost simultaneously. As smartphones are available to use separate application programs like a PC, numerous IT developers have jumped into the mobile application development business. Smartphones have hugely influenced on booming up of the software industry. They have also led many companies and designer groups to explore the hardware industry for making their accessories. As smartphones are becoming an expensive

total digital platform, many people became to need auxiliary accessories to protect their expensive smartphones and enhance its usability and functions. There are a number of smartphone accessories are being introduced because the smartphone market is rapidly and constantly growing.

Therefore, the smartphone accessories can be ideal items to apply and realize successful metaphoric expressions in the product development process because of consumer's cultural aspect as well as business aspect. The market has grown and guarantees large number of consumers and sales channels. Moreover, the consumer's reaction and feedbacks about the design can be read quite fast in the trend of smartphone accessories since the gadget became an indispensable tool of everyday.

*"Products must elicit positive emotions when experienced, both psychologically and physiologically, thus forming a powerful emotional attachment between the user and the product". (Fulton, 1993)*

The purpose of this project is creating a pleasurable product for users, letting them interact and grow empathy for the product. The method of the project embraces building an emotional attachment between the user and the product. This case study may provide some concrete data to discuss the effectiveness of

metaphors in design domain.

## 2. Research

### 2.1. Market & trend

#### **Market**

*"A report from analyst firm Canalys has named Asia as the world's largest market for smartphones, based on sales. The last year has seen the region's smartphone industry almost double to account for 40 percent of the world's smartphone sales." (Jon Russell, Asia now world's biggest smartphone market, 2011)*

Designers communicate with users through design. Their way of expression in design is the medium and it becomes the message to users. The kind of medium

designers choose affects the content of the message. (Hjelm, 2002)

The smartphone world is expanding at a rapid pace. According to a market research firm Ovum, there are already more than 1.08 billion smartphone users in the world and Asia's smartphone market will double its size by 2016 to reach 200 million shipments (Figure 18). Global smartphone sales will hit 653 million shipments that same year, of which Asia will account for 30

percent. Principal analyst, Adam Leach, noted in the report that the smartphone market will see significant growth over the next five years, “once again outperforming the wider mobile phone market”. According to Ovum, smartphones in the Asia-Pacific will grow at a compound annual growth rate of 12.5 percent between 2009 and 2016, and eventually account for 32 percent of the region’s overall mobile phone market (Yap, 2011).

Smartphone has been in the spotlight for the latest years as it embraces various functions in one piece of gadget. Smartphones are now a mobile phone, digital camera, mp3 player, TV, radio, GPS navigator and video game console, etc. They are mini computers in modern people’s pockets. However, they seem to need additional parts in order to protect the smartphones’ fragility against shocks as well as to serve certain functions more easily (Moon, 2012). Moreover, in comparison with the past market, where a number of different styles of mobile phones were available, the market of smartphones nowadays has less product lines. This means less options for customers to choose. Simply saying, it turned out easier to find someone who has the same product as mine than before. First of all, there are only few companies that occupy the market. Secondly, the nature of smartphone requires longer time and more cost to develop a single product while other conventional mobile phones used to re-

lease many products in a short period of time.

Modern people with strong individualism tend to utilize their own smartphones with their favorite functions (applications). However, the limited number of product design seems not to differentiate from other users of the same products by the shape design. Differentiating the appearance is something more visible than differentiating the application for their uses in the perspective of people those who have desire to decorate their own mobile phones. In addition, there are various types of user groups in the market according to gender, age, etc. Thus, smartphone accessories are demanded for the differentiation which satisfies each user group’s preferences.

In consideration of the above, smartphone protective case (cover) was chosen to develop for this project among other smartphone-related items. Smartphone case is one of the fundamental accessories, which not only protects sensitive and fragile smartphones, but also embraces the product so it is an appropriate item to give some uniqueness (Moon, 2012).

Smartphone protective cases have been developed at the earliest among other accessories since the smartphone’s emergence. They have become one of the most common and popular products among smartphone users nowadays and plenty of different brands



are competing against each other to be chosen by consumers (Moon, 2012).

- Out of the 5 billion mobile phone users in the world, 1.08 billion are smartphone users.

- 89% of smartphone users use their smart phones throughout the day.

- The age group of 25-34 has the highest smartphone penetration rate of 62%.

- 53% of smartphone users are male and 47% are female.

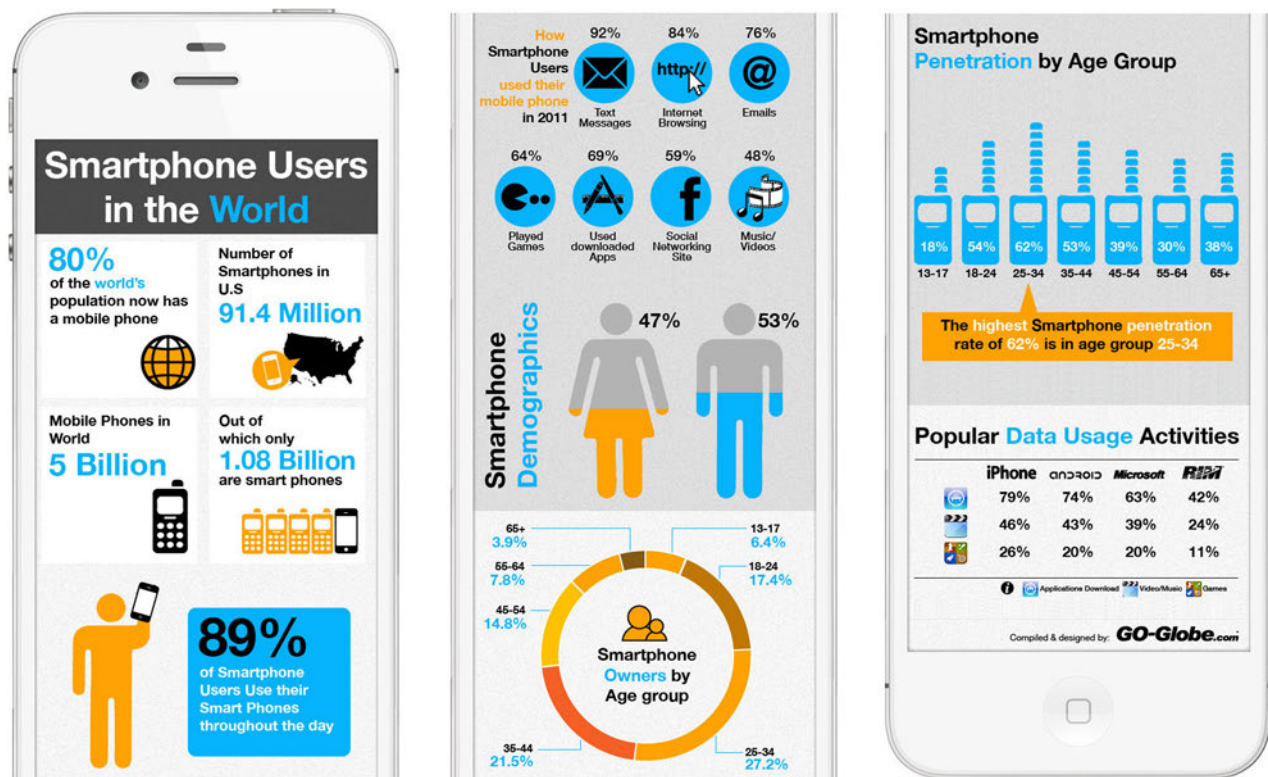


Figure 18. Smartphone Users Around the World - Statistics and Facts (Infographic by- GO-Gulf.com Web Design Company, 2012)

\*Printed with permission

## Trend

According to the major features of smartphone protective cases, I have categorized them into two different kinds of approaches; function-oriented and fashion-oriented.

Function-oriented smartphone cases integrate themselves with the function as a stand that helps to watch video or to video call without holding it or with another function as a simple card wallet such as name card, bank card or traffic card. The precedence over all others is the function as a protective shell which safeguards from the shock in case of dropping a smartphone.

The fashion-oriented takes the further role as decoration which differentiates from other products in appearance beyond the role of protection. Designs are created through various colors, patterns, and forms so as to be stylized by many options. The auxiliary products which help to express the individuality are popular. It can be seen as a big trend as mainly young generations use the smartphone.

The smartphone protective cases recently have conquered a large proportion in the market. They have evolved from the conventionally simple design, just to protect the product from shock and damage, to vari-

ous shapes of design in silicone, luxurious leather cover, or fashionable cover with graphic patterns printed on, etc. This phenomenon can be seen remarkably in the Asian market.

## Character in Smartphone protective case

At the time when already a number of smartphone cases in diverse types of materials and designs were circulating in the market, but still most products did not stand out, a smartphone cover brand with rabbit ears on top of it had been a big hit in South Korea and Asia. An ordinary silicone cover with rabbit ears on the case-head is named 'Rabito' (Figure 19) and the Rabito's cute rabbit ears attracted huge attention of young females while other brands were appealing only with different colors, patterns and textures.

The metaphoric factors can be seen in this sensational 'Rabito' case. Even though the totally non-functional rabbit ears make the whole volume of the smartphone bulky (so it consequently causes inconvenience to carry), the brand succeeded to penetrate the context of young female consumers' desire. The success factor depends on the fact that rabbit ears are considered as a symbol of cuteness to female and they also represent female sexiness. So to speak, the case was anthropomorphized with the characteristics of rabbit; cuteness and loveliness, thereafter drew attention and created empathy from young female users.

Second, it succeeded to create emotional attachment from the consumers by metaphoric design which links the product and the consumer. That hit the specific

consumer group with the unique design at the time when the market was monotonous in the lack of variety. These contribute the biggest dissimilarity in comparison to other products.

In the wave of the Rabito's success, other cases have been booming up by applying the feature of cartoon characters as placing at a part of sub-category in the smartphone case market. However, most of them do not seem to understand the consumer's empathic context. Many products do not contain an image or a source which the target user might love or do not express an appropriate subtlety, thus they are not appealing to consumers.



Figure 19. Rabito (smartphone protective case)

## 2.2. User study with metaphors

### **Designing the Questionnaire and User Research**

There are similar studies related to product metaphors by two researchers in Department of Industrial Design in Delft University of Technology, the Netherlands. In their preliminary study, 'A Framework for Metaphor Generation and Experience in Products' (Cila & Hekkert, 2009), the authors pointed out that metaphors are employed by designers to raise new aspects to products and to enhance their appeal and meaningfulness as the metaphors are inevitable in our everyday lives in such use of language. Five different reasons were sorted and listed for applying metaphors in products; identification, use, symbolic, message, and fun.

The researchers approach to their project as aiming to provide designers on creating successful metaphors by examining the appropriateness/comprehensibility of a design metaphor with those 5 keywords and the variables. This study, however, adopts them to look into metaphorical links within the product itself than framing the database. Due to the sophisticated classification of the designer's intention which is directly connected to the user's context, this survey engages those 5 attributions to find user's mindset to meta-

phors in various product designs. For this, 10 different categories of products are selected and each category consists of two different products; metaphor applied and non-metaphor applied.

This questionnaire is designed in order to find what factors make users pleasurable in using a product beyond merely the usability thereafter, to reflect the insights before the actual product development process. First of all, the five different properties below are stated to define how each one is related to the users with pleasurable experience.

## IDENTIFICATION

It makes you easy to recognize what it is. (categorization of the product)  
(e.g. - When you see a cup, you easily know that it is a cup)



## USE

It makes you easy to understand how to use.  
(e.g. - Trash bin icon lets you know that you can delete files through it)



## SYMBOLIC

It presents a symbolic meaning.  
(e.g. - Coffee maker looks like serving you)



## MESSAGE

It promotes or criticizes ideological issues and provides messages.  
(e.g. - Glacier-look eraser reminds you of global warming)



## FUN

It makes you smile.  
(e.g. - Humor or funny images)



**Q1. Which property do you think the most important when you buy and use products?**

**Q2. Questions with samples.**

(In the next 10 questions, each question consists of two images of product examples and asks interviewees to choose one and the reasons. The examples of A in all questions are intended to represent the metaphoric design in products with one or two of the properties above while the examples of B are intended to refer ordinary and conventional design of everyday objects)

1.

- To which trash bin do you want to throw trash between those two trash bins?
- Why?
- Match your selection with the equivalent properties from those 5 different properties  
( 1.Identification 2.Use 3.Symbolic 4.Message 5.Fun )



2.

- Which CD player do you want to play the music?

- Why?

- Match your selection with the equivalent properties from those 5 different properties

( 1.Identification 2.Use 3.Symbolic 4.Message 5.Fun )



3.

- Which ash tray do you prefer? (for yourself or family , friends)

- Why?

- Match your selection with the equivalent properties from those 5 different properties

( 1.Identification 2.Use 3.Symbolic 4.Message 5.Fun )





4.

- Which chair do you want to have a rest?

- Why?

- Match your selection with the equivalent properties from those 5 different properties

( 1.Identification 2.Use 3.Symbolic 4.Message 5.Fun )



A.



B.

5.

- From where do you want to pick a toothpick?

- Why?

- Match your selection with the equivalent properties from those 5 different properties

( 1.Identification 2.Use 3.Symbolic 4.Message 5.Fun )



A.



B.

6.

- Which pepper & salt shaker do you want to use for your dinner?

- Why?

- Match your selection with the equivalent properties from those 5 different properties

( 1.Identification 2.Use 3.Symbolic 4.Message 5.Fun )



A.



B.

7.

- To where do you want to put your pot?

- Why?

- Match your selection with the equivalent properties from those 5 different properties

( 1.Identification 2.Use 3.Symbolic 4.Message 5.Fun )



A.



B.

8.

- From where do you want to pick a clip?

- Why?

- Match your selection with the equivalent properties from those 5 different properties

( 1.Identification 2.Use 3.Symbolic 4.Message 5.Fun )



A.



B.

9.

- To which money box do you want to put your coin?

- Why?

- Match your selection with the equivalent properties from those 5 different properties

( 1.Identification 2.Use 3.Symbolic 4.Message 5.Fun )



A.



B.

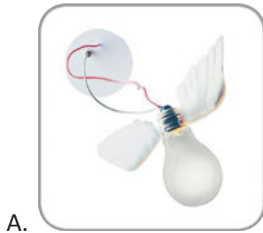
10.

- Which lamp do you want for your room?

- Why?

- Match your selection with the equivalent properties from those 5 different properties

( 1.Identification 2.Use 3.Symbolic 4.Message 5.Fun )



**Q3. Which product from the above examples do you think the most pleasurable to you?**

1.

> 2.

> 3.

Any reason?

**Q4. What is your best pleasurable experience with a product that you ever had?**

**Q5. What kind of products makes you pleasurable?**

**Q6. What kind of factors affects you when you buy products?**

**Q7. Smartphone cover case**

1. Do you feel smartphone cover is needed? 1 2 3 4 5

2. How many smartphone cover do you have?

3. What is the need of smartphone cover for you?
- To protect your smartphone    1   2   3   4   5
  - To make up your smartphone    1   2   3   4   5
  - To supplement Usability       1   2   3   4   5
4. When you buy smartphone cover, what do you consider?
- Price            1   2   3   4   5
  - Appearance    1   2   3   4   5
  - Functionality   1   2   3   4   5
  - Uniqueness    1   2   3   4   5
5. What material (feeling) do you prefer for smartphone cover?
- 1. Hard            2. Soft

## Result and Analysis

These questions were given and tested to 7 interviewees in November 2011. Since then, after some modification, these questions were given again to 16 interviewees from different countries via email between March and April 2012; Finland (5), Japan (2), Korea (3), China (2), Thailand (1), and Mexico (3), and in different ages (20-40's), genders; male and female and the fields of profession; design, education, business, and students.

1. Shimbashi (M, 33) Japanese, Architecture
2. Nakanishi (F, 31) Japanese, Designer
3. Kim (F, 31) Korean, Digital Media
4. Lee (F, 25) Korean, Fashion Design
5. In (F, 28) Korean, Early Childhood Ed
6. Yang (F, 23) Chinese, Student
7. Xu (F, 23) Chinese, Student (Business)
8. Nantharat (F, 21) Thailand, Student
9. Lassi (M, 13) Finnish, Student
10. SKallio (M, 36) Finnish, Designer
11. Kokkonen (M, 27) Finnish, Startup
12. Kosonen (F, 30) Finnish, Design
13. Leea (F, 41) Finnish, Consultant
14. Gurrola (M, 27) Mexican, Industrial Design
15. Arenas (F, 27) Mexican, Industrial Design
16. Torrero (F, 31) Mexican, Interior Design

Before the interviewees started to answer to 10 questions of Q2, 62.5% of them answered 'use' is the most important when they buy or use products and then 'fun', 'message' and 'identity' were ranked in order. Unlikely to this, most of people chose A rather than B in all questions except for question number 3 and 7. The example A in question number 3 was an ashtray in the explicit shape of lung and slightly more than half of people answered that they felt uncomfortable and the design delivers too strong message to use the object. The example A in question number 7 was a pot stand in the form of human lying under the pot. Again, 9 people out of 16 interviewees chose B with the reasons of safety, usability, and lack of relevancy in A. Also, looking into the reasons why they chose examples A in each question, 'fun' was overwhelmingly favoured and then, 'symbolic', 'use', 'message' and 'identification' were ranked in order.

As for any bias according to the different cultural backgrounds, no dominance was found from the answers but some interesting points were detected. The 60% of the Mexicans and 30% of Koreans mentioned the words, 'fun' or 'humour' for the reasons of their preference more than twice during the whole questionnaire whereas the rest seldom referred those words.

Another intriguing finding was that only the interviewees from Asia stated the word, 'cute' or 'lovely' for the reasons of their preferences. 62.5% of the total Asians mentioned those words more than twice as sympathizing to the products during the whole questionnaire.

Although the volume of the interviewed samples is fairly small, it enabled to glance at which metaphoric links people would prefer on products as well as to presume the social or cultural understanding about those five properties stated earlier in this chapter.





### 3. Designing smartphone cover with Metaphor

#### Target User Context

From the point of user study, it can be clearly seen that metaphors in products can become a major factor which draws users' attention and erects affection, when properly used. Similar to the market & trend study, Asian interviewees seemed to consider metaphors in products as a factor of fun and cute. Considering the result of user study and the market situation which Asia is the biggest market for smartphone cover and accessories, I decided the target user group for Asian young females aged from late teens to early 30s.

This target user group is interested in fashion and tend

to consume much more than any other user groups. In the questionnaire, most of the Asian interviewees said that they own more than three cases (at maximum 11 cases). They answered that they buy smartphone cases for make-up purposes than other purposes such as protection or auxiliary functions. Also, the interviewees commented that the appearance is the most important factor to make a decision to purchase.

## **Designer's intention**

In the Asian market, a huge number of smartphone covers overflowed and many of them targeting young females are excessively cute. Many of them do not even fulfill the most important and basic function of smartphone cover; protection of smartphones from drops, shocks and bumps. For this reason, those products which contain anthropomorphic characters or images are considered as just kitschy. As a designer who believes that the original function of product should be the most important priority in design, I wanted to introduce a smartphone cover which fulfills the protection with satisfying those users' desire to make up their smartphone through metaphoric expression. Moreover, I intended to realize the metaphor to provide a useful function in order to avoid any negative perceptions that reflect metaphors in products just kitschy and impractical.

## Source for mapping

Inspiring from Rabito's smartphone case with rabbit ears on the head of the case, I intended to embed anthropomorphic source through a positive metaphor which is perceived as fun and cute from the target user group (Asian females from late teens to early 30s) into a smartphone cover. Many smartphone cases targeting that user group have applied anthropomorphic sources for example, ears, arms or tails. What I intended to achieve is to build a positive connection to the shape with a useful and functional element, ultimately seeking for meaningful metaphors in products.

In the meantime, I came up with the expression of 'having wings' and defined that the word 'wings' implies many positive meanings such as hope, fly, freedom, growth, etc. While looking for the source to link the wings with the target group's favorite image I found out angel wings from their context. There are many products and services for young female consumers with employing the image of angel, appealing their feminine emotion. For instance, franchised café in Korea whose main target is the youngsters is named as 'Angel-In-Us' (Figure 20) with its angel logo having wings. The café brand has been very successful and popular among them because of the holistic concept of cozy and alternative space with the image of angel.

Besides, the angel image is embedded in many female accessories and products not only in Asia, but also all over the world. From those reasons, I chose angel wings as a source for mapping a smartphone cover case and named it as "angel-it!" by integrating its image with its brand name "stre-it! Helsinki".



Figure 20. Angel-in-us Coffee

## Subtlety in realization

As it is explained in the theoretical study, a proper description of metaphor in design is dealt with subtle expression of the source, and the degree of subtlety is a combination of designer's intention and user's context. Designing a smartphone cover with applying angel wings as a metaphoric source to express fun and cute for the target users, I intended to express it not only in form but also in function. Subtlety of description in design metaphor can be expressed through its functional attachment as well as its vague appearance. Furthermore, through the functional attachment the form of product can buy more justification from users.

In the observation of smartphone users I found out the need of stand when they watch movies or make a video call through their smartphone as well as when browsing the internet. Especially for youngsters, the function of stand is very useful as they get along with their smartphone throughout the day (Figure 18). For that reason, there are already many stand-function accessories for smartphones in the market and I decided to design angel wings function as an attachable stand which can enhance its value. iPhone 4/4s was chosen as the applicable smartphone considering its majority of market share.

For visualization of the concept, the design keywords are defined as follows.

### Design keywords

- Cute, fun
- Angel wings (attachable)
- Function as a stand



Figure 21. Angel-wing pendant

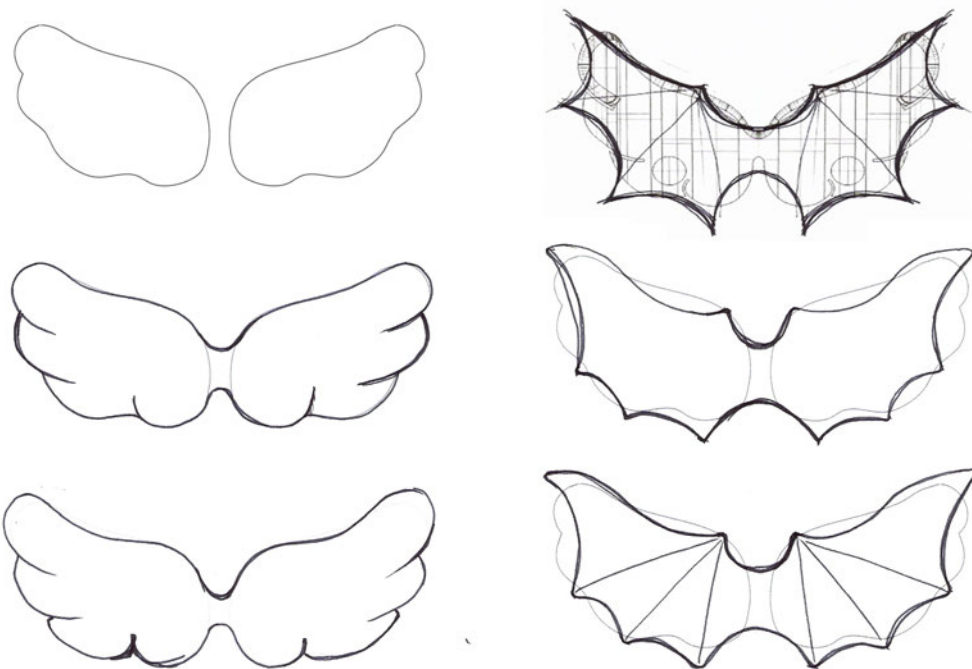
## Concept Development

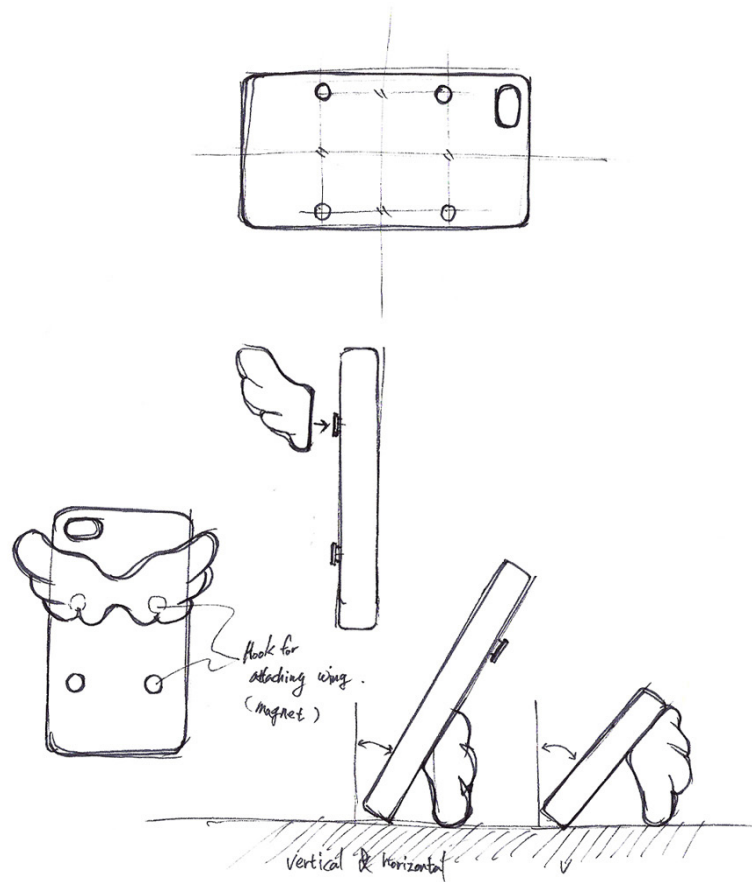
During the concept development, a new concept of devil wings is conceived from the idea that the figure of angel is always compared to the figure of devil.



Figure 22. Angel&Demons (Author: Dan Brown, 2000, filmed in 2009)

- Concept Drawing

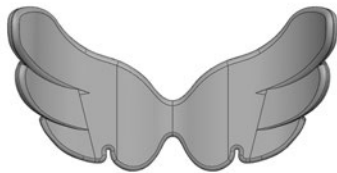
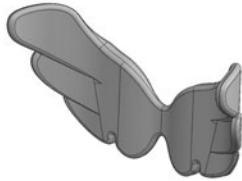




- 3D Modeling



TOP



FRONT



SIDE



TOP



FRONT

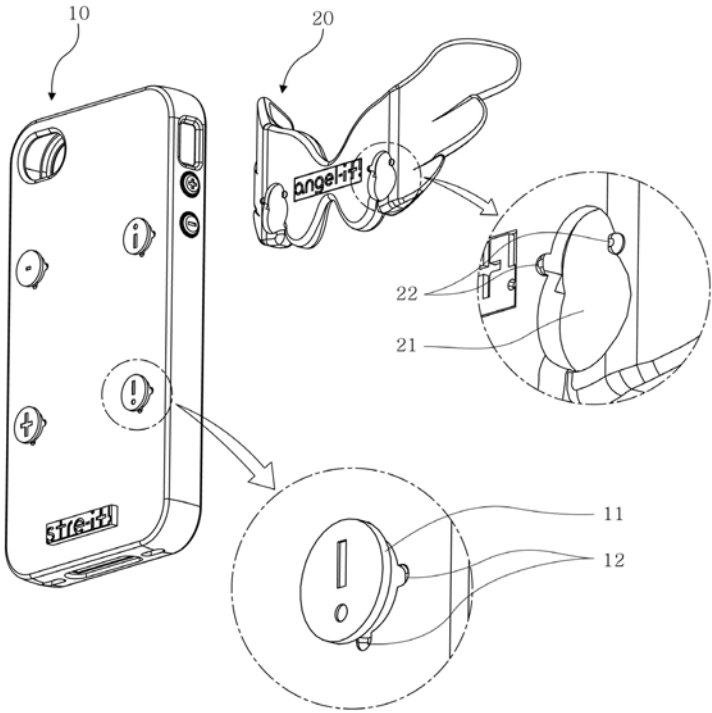


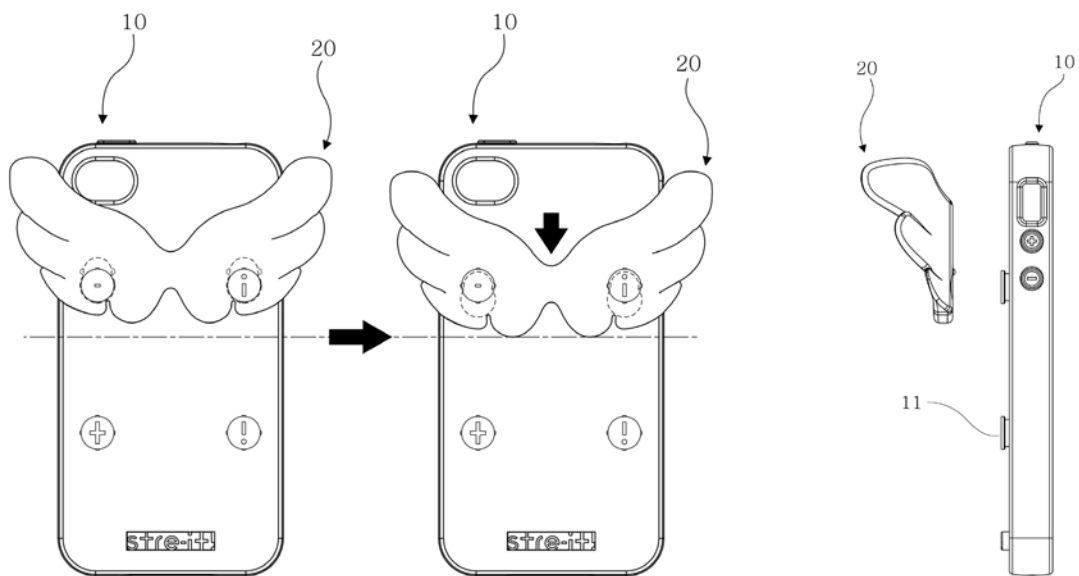
SIDE

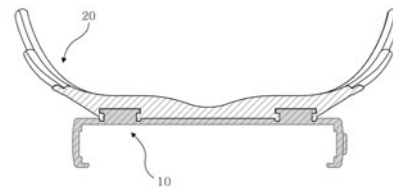
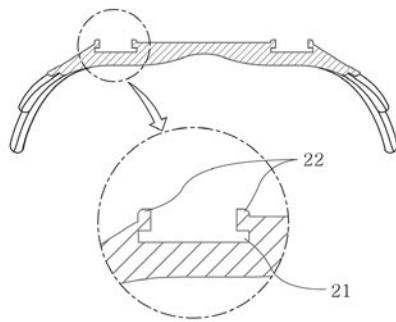
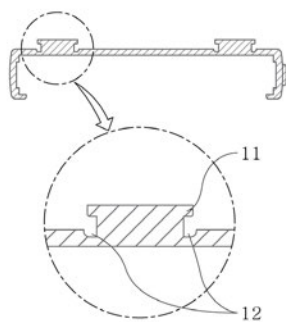
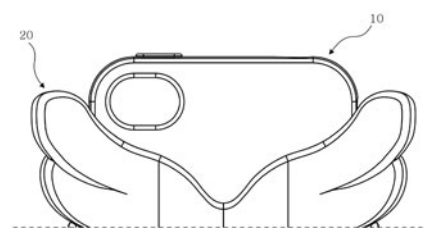
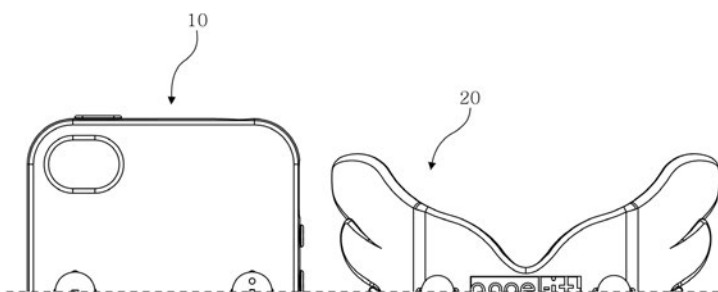


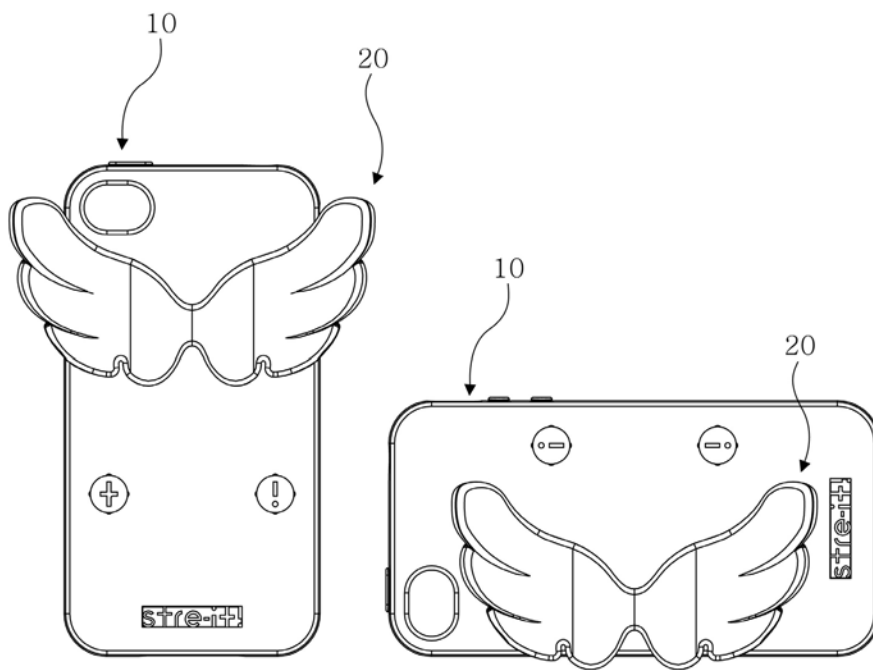


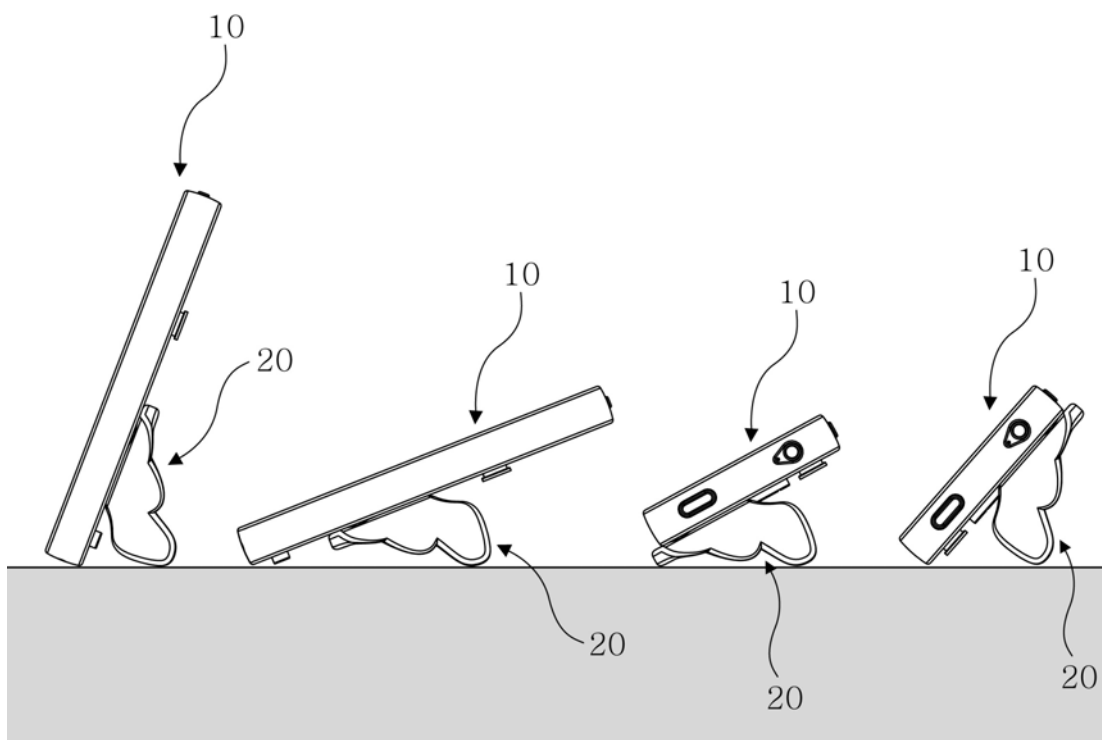
- Mechanical Drawing











**- Prototype**

(Rapid Prototype Printing)



## - Material

There are three main materials applied in smartphone cover cases; PC (Polycarbonate) (Figure 23), Silicone (Figure 24), TPU (Thermoplastic Polyurethane) (Figure 25). Polycarbonate is a durable plastic material mainly used for electronic applications and various products associated with electrical and telecommunications hardware that capitalize on its collective safety features (Wikipedia). For this reason, polycarbonate is the most popular material for making smartphone covers. However, it features hard and not flexible so it does not absorb any impact from drops, shocks and bumps. While, silicone is a soft and flexible material like rubber so that it can protect the smartphone from the outside impact. However, silicone has a very low tensile strength that makes the shape of smartphone cover stretches easily since its application.

On the other hand, thermoplastic polyurethane has both merits of polycarbonate and silicone; durability, flexibility and softness. Its features are as follows.

- excellent abrasion resistance
- outstanding low-temperature performance
- excellent mechanical properties, combined with a rubber-like elasticity

- high shear strength
  - high elasticity
  - high transparency
  - good oil and grease resistance
- (Wikipedia)

From those beneficial features, TPU became a popular material for smartphone cover. However, its material price is expensive and its manufacturing process is sensitive and difficult comparing to the polycarbonate and silicone. Moreover, most people have a bias view that soft cases are cheaper than hard cases. Those issues cause many manufactures tend to avoid using TPU for smartphone covers these days.

Although those defects and tendency, I decided to apply TPU for the smartphone cover, angel-it! because it only satisfies the basic functional requirements; protection and durability. Furthermore, its soft and flexible features fit to the concept of cute and fun comparing to other materials.





Figure 23. Polycarbonate cover

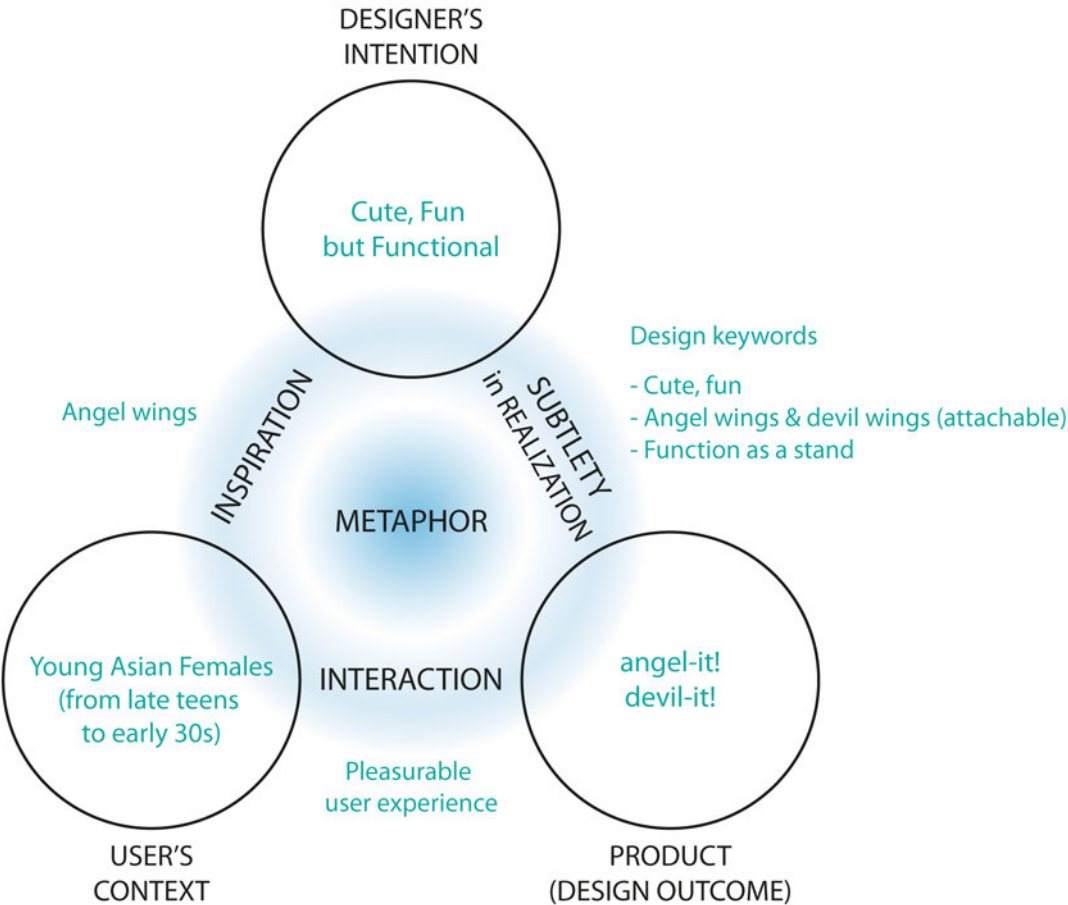


Figure 24. Silicone cover



Figure 25. TPU cover

Application to the processes of design through metaphor (Figure 12)



## 4. Outcome & evaluation

### **Outcome**

Two types of smartphone cover, angel-it! and devil-it! are developed by approaching the product design process with metaphoric expression. Those covers are developed to fit in iPhone 4/4s, which measurement and drawings are referred to Apple developer web site. All the design processes were progressed in Finland and manufacturing process was managed in Korea. Details of the outcome are as follows.



 **angel-it!**™  
wings on your smartphone



 **devil-it!**™  
wings on your smartphone



## Stand for facetime and movies

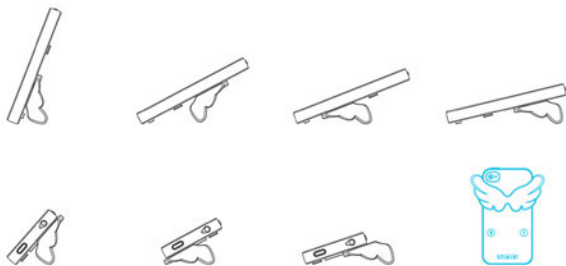
The it!-click system is our own innovative solution to support you have better experience with your Smartphone.

It features four buttons behind the cover which are designed for easy and quick attaching as well as detaching the wing-stand in all directions. An attached wing on the soft case makes your Smartphone self-standing, and it effectively works for when watching movies or making a video call. The it!-click system lets you to adjust the wing in different angles according to where to click it among four buttons.



PATENT REGISTERED  
PATENT PENDING

20-2012-0001466  
20-2011-0011167 30-2012-0008052  
30-2012-0008062









## Easy grip for gaming and typing

**Wing provides easy and comfortable grip for game and chat.**

The entertainment with Smartphones is becoming a major part in smartphone use, as people spend more time with their own Smartphones. For example, game applications are the most popular in the App Store through the smartphone users. However, smartphones may generate some ergonomic problems since these phones are not specially designed for gaming purposes.

Observing carefully the users' behavior, angel-it! proposes it!-click solution with its wings, which provides easy and comfortable grip for especially gaming and typing.

## Fit on your body

**Wing is designed to fit on the body line.**

**angel-it!** and **devil-it!** are made of the high-grade TPU (Thermoplastic Poly Urethane) which is flexible yet durable, providing enhanced protection from drops, shocks and bumps as well as smooth yet slip-free grip. The curves of wings and its fine material are sophisticatedly designed and selected to fit on the human body despite the bias against the shape.





### Products of other companies



### Detail features

**Sophiscated design in detail and finishing are incomparable to other products.**

angel-it! and devil-it! underwent mutiple tests to achieve high quality button press in the development process.

They feature enhanced surface quality without cutting marks commonly found in other products.

Wings on your SmartPhone!



**stre-it!**Helsinki  
[www.stre-it.com](http://www.stre-it.com)

## Evaluation

The questionnaire (Figure 26) was given again to the same candidates as the ones in the first task except for one Finnish female, Leea (F, 41). The answers were received from them since they have used angel-it! and devil-it! for 1-2 months.

1. Shimbashi (M, 33) Japanese, Architecture (2 months used)
2. Nakanishi (F, 31) Japanese, Designer (2 months)
3. Kim (F, 31) Korean, Digital Media (2 months)
4. Lee (F, 25) Korean, Fashion Design (2 months)
5. In (F, 28) Korean, Early Childhood Ed (2months)
6. Yang (F, 23) Chinese, Student (2 months)
7. Xu (F, 23) Chinese, Student (Business) (1 month)
8. Nantharat (F, 21) Thailand, Student (1 month)
9. Lassi (M, 13) Finnish, Student (1 month)
10. Kallio (M, 36) Finnish, Designer (1 month)
11. Kokkonen (M, 27) Finnish, Startup (1 month)
12. Kosonen (F, 30) Finnish, Design (1 month)
13. Gurrola (M, 27) Mexican, Industrial Design (1 month)
14. Arenas (F, 27) Mexican, Industrial Design (1 month)
15. Torrero (F, 31) Mexican, Interior Design (1 month)

Questions are divided in two different sections: General questions about smart phone cases, and questions about angel-it! and devil-it!. The questions in the first part were to find out the interviewees' consuming

patterns from their general information regarding to smartphone cases.

For the question of how many smartphone covers they have, slightly more than half of the whole interviewees said that they have more than 3 pieces for themselves. Interestingly, 62.5% of that was from Asia. Moreover, one girl from Thailand answered she owns 11 covers, exceptionally.

As for the question of what is their main purpose of having smartphone covers is:

'to protect your smartphone' was ranked the highest and then, 'to make up your smartphone' for the second highest.

For the question; what are the important factors to make an actual purchase of a smartphone case among these: price, appearance, functionality, uniqueness. 93% of the interviewees scored at the highest position for appearance as saying that it is the most important factor when they buy smartphone protective cases. Functionality and uniqueness were ranked similarly important to each other. On the other hand, the number of who high-scored that price is the most important was only one.

From this question, it is assumed that appearance of a smartphone case attracts people at most in the beginning of purchase decision and keep supporting the decision in the following processes. Appearance here is stated as a form of lingual aspect. In this sense, the uniqueness is about how a user differentiate himself from others.

Next, the questions about angel-it! and devil-it! were designed to discover the users' reactions and feedbacks, especially to ensure whether the embedded metaphor in the product has been delivered to the people.

Three main keywords from the feedback about what was the first impression about the product were: cute and lovely, fun, and unique. Unlikely to the result of the first questionnaire, there was not any cultural bias about describing in such words.

However, there was the dominance in answers of each gender as for the question of whether they like the functionality of having a wing as a stand and whether they find meaningful connection. About 82% of the female candidates marked high on the question of preference while 50% of the males put themselves in neutral on the question. Meanwhile, most of candidates found the wings meaningful for both men and women, except one person neutralized himself.

Consequently, the user study shows that the outcome of this design practice by employing metaphors achieved the target users' positive feedback as it was planned. The embedded metaphoric source, angel wings easily attracted them and triggered their emotional interaction with the product. For most of them, angel-it! and devil-it! brought a pleasurable experience.

On the other hand, there were also some negative feedbacks. Although, most of those came from untar- geted users, many users pointed that the wings disturb to carry their smartphone in their pocket. The applied metaphor fulfilled their eager to have a cute and fun product with enhancing their functional requirements. However, it can be a degradable element for the product's original feature at the same time.

- Name :
- Gender :
- Age :
- Nationality :
- Field :

About angel-it! & devil-it!

1. Do you like its appearance? 1 2 3 4 5
2. What was your first impression about its appearance?
3. What do you think about wings with smartphone cover in appearance?
4. Do you like its material? 1 2 3 4 5
5. Do you think the degree of wing design is appropriate?  
< It should be more simplified < 1 < 2 < 3 > 4 > 5 > It should be more detailed (realistic) >
6. What do you think about its wing as a stand?  
< I cannot find any connection < 1 < 2 < 3 > 4 > 5 > It is meaningful >
7. What shape or image beside wings would be appropriate for stand?
8. What if the stand (wing) has no image association? (anonymous image)  
1 2 3 4 5
9. Is there any difficulty with attaching wing on the cover?
10. Do you like the functionality of the wing as a stand for your smartphone?  
1 2 3 4 5
11. Has this smartphone cover made you pleasurable? (not just usable and satisfying)
12. If yes, what point made you pleasurable?
13. Has this smartphone cover made you annoying?
14. If yes, what point made you annoying?
15. What is your friends' reaction when they see your smartphone cover?
16. Merits of this smartphone cover?
17. Demerits of this smartphone cover?
18. Would you recommend this cover to your friends?

Figure 26. Questionnair for Evaluation

**CONCLUSION**

This thesis began from the question to myself about how to understand and approach design through my former studies and experiences in the design field. From the long journey to find the answer, I arrived at the topic, 'metaphor'. The more I study and explore this topic, the more I feel that there should be further study and detailed investigation. The subject of the study on metaphors in design itself is broad, however, this thesis has aimed to contribute a guideline for the further career of myself and also for other designers.

First, I studied the theory about metaphors in design from Part I. Second, I performed a user study on what attributions of metaphors people like to have in prod-

ucts, then designed a smartphone protective case with applying findings. Finally, the outcomes were evaluated by several users.

The topic of this thesis is the communication between designers and users, and the interaction between products and user through metaphoric expressions. Designers can acquire inspiration to achieve meaningfulness in products through approaching the subject with the implementation of metaphors, and users can understand and experience the product through interacting with it.

Design is a process of finding solutions through designer's imagination and intuition together with analyzing

and interpreting information and data of the subject. This is similar to metaphoric expressions that the author describes what he or she wants to deliver through referencing the audience's background.

The communication, in this text, means interaction because it creates reciprocal action or influence. To achieve the communicative role in design, there should be a source of meaning, the meaning that user can get familiar and interact. Thus, designers ultimately try to achieve meaningfulness in their design. Nowadays, products are required to provide user experience which users can emotionally interact with, as well as the aesthetic form and usability beyond the functional requirement. As 'User Experience' is currently becoming the most focused issue in the design domain, how to achieve the meaningfulness for user is central to the issue. Meaningfulness, the emotional attachment between product and user can trigger the interaction which can extend the user experience.

Design's communicative role can be fulfilled through metaphoric expressions that consist of designer's intention and user's context. Studying and understanding about user is a prerequisite of the design process in order to deliver designer's intended meaning correctly and effectively. With this, designers can have a perspective to see how things are perceived and experienced by users. This may provide them with inspirations to create

a meaning in their designs. It becomes reasonable reference for them to conceive appropriate ideas for the solution. Those references can also become a rhetorical source for designers to decorate the product not only in the form, but also in the function and usability by adding layers of meanings. To become meaningful and affluent when experienced by users, the embedded meaning should be correlated with the character of product and user's context. Thus, designers should be aware of the context in which the metaphor is being used. Different cultures have different conceptual frameworks. A certain metaphor applied in two different cultures may arrive at different or opposite responses. It requires designers to carefully use metaphors in design.

The concept of meaning creation in metaphoric expressions can be seen in many design approaches such as design semiotics, anthropomorphic design and affordance design. All of them come with interactions from embedded meanings. Also, from many successful designs, it can be easily seen that those metaphoric expressions perform an important role. As it was introduced in the chapter 5, from Apple's design history, which has brought a lot of huge innovations in the development of PC and our current digital life, we can spot metaphors. Employing metaphors in design does not only enhance the value of product and service, but also brand and corporate identity by infusing them with meaningfulness. Meaningfulness of product is the com-



municative power in relation to the products ways of utilization; function and other cultural values.

Designers are now required to propose not only what users request, but also what they may need although they do not recognize yet. Understanding and employing meanings behind the relationship between products and users through metaphors can provide a perspective and insight on how to approach to fulfill those latent requirements.

From the product development practice, I could conclude that approaching the design process with metaphoric expressions provides perspectives how to understand users and how to apply findings to design. As the survey shows, properly embedded metaphors in design can attract users leading them to interact with products and enhance emotional attachment between users and products. Through this actual application together with the examples in the theory part, it may become a tangible source for designers to understand how to employ metaphors in the actual design process.

The application of metaphors in this project was confined to the limited user group and culture, especially young females in Asia. However, metaphors can be applied in various design domains. In my future studies, I will continue more design practice projects in broader cultural background by applying those various features

of metaphors which were studied in the theory part for reflecting more cultural and social values.

# REFERENCES

- Ashcraft, Brian (2007). *Without Thought*, *Metropolis-Mag.com*. Available from: <http://www.metropolismag.com/story/20070518/without-thought> [Accessed 21 April 2012].
- Burke, Kenneth (1945). *A Grammar of Motives*, University of California Press, 503-504.
- Bushe, G.R. (2009). *Learning from Collective Experience: A Different View of Organizational Learning*, the Organization Development Network.
- Cila, Nazli & Hekkert, Paul (2009). *Product Metaphor: A Framework for Metaphor Generation and Experience in Products*, Delft University of Technology.
- Design Museum (2006) [Online]. *Anglepoise Lamp (1933)*, Design Museum Collection, Great British Design Quest. Available from: <http://designmuseum.org/design/anglepoise> [Accessed 5 September 2012].
- English for Students*. [Online]. Available from: <http://www.english-for-students.com/FigurativeExpression.html> [Accessed 13 July 2012].
- Erickson, T. D. (1990). Working with interface metaphors. In B. Laurel (Ed.), *The art of Human-Computer Interface Design*, 65-73, MA: Addison-Wesley Publishing Company, Inc.
- Fulton, J. (1993). *Physiology and design: New human factors*, *American Center for Design Journal* 7 (1): 7-15.
- Gibson, James J. (1977). *The Theory of Affordances*. In *Perceiving, Acting, and Knowing*, Eds. Robert Shaw and John Bransford, ISBN 0-470-99014-7.
- Hallman, R.J. (1963). *The necessary and sufficient conditions of creativity*. *Journal of Humanistic Psychology*, 3(1), 14-27.
- Hekkert, Paul & Cila, Nazli (2009). *Metaphorical communication and appreciation in product design*, Extended abstract, Delft University of Technology.
- Hjelm, Sara Ilstedt (2002). *Semiotics in product design, CID, CENTRE FOR USER ORIENTED IT DESIGN*, KTH (Royal Institute of Technology), ISSN 1403 - 0721 (print) 1403 - 073 X (Web/PDF)
- Hodge, Challis (2003). *Semiotics: A Primer for Designers, Boxes and arrows*. Available from: [http://www.bboxesandarrows.com/view/semiotics\\_a\\_primer\\_for\\_designers](http://www.bboxesandarrows.com/view/semiotics_a_primer_for_designers) [Accessed 27 May 2012].
- Holme, Randal (2001). *Teaching language as metaphor: the potential of current research into metaphor and cognition for classroom practice*. Doctoral thesis, Durham University.

Horn, Bruce. (2007). "On Xerox, Apple and Progress". Folklore.org. Retrieved February 3, 2007. Available from: [http://www.folklore.org/StoryView.py?project=Macintosh&story=On\\_Xerox,\\_Apple\\_and\\_Progress.txt](http://www.folklore.org/StoryView.py?project=Macintosh&story=On_Xerox,_Apple_and_Progress.txt) [Accessed 12 August 2012].

Hume, David (1757). *The Natural History of Religion*, MobileReference.

Jordan, Patrick W. (2000). *Designing Pleasurable Products: An introduction to the new human factors*, Taylor & Francis Inc, 1-19

Karjalainen, Toni-Matti (2010). *In quest of strategically meaningful and attractive forms*, In S.Vihma (ed.), *Design Semiotics in Use*. Aalto University School of Art and Design, Helsinki. 180-195.

Koestler, Arthur (1964). *The Act of Creation*, Macmillan, New York.

Lakoff, G. & Johnson, M (1980). *Metaphors We Live By*, University of Chicago Press.

McLuhan, Marshall (1964). *Understanding Media: The Extensions of Man*, McGraw-Hill, ISBN 81-14-67535-7.

Moon, Brad (2012). *The Apple Effect and Protective Cases: They're one reason why sales of Apple accessories*

*are expected to top \$5 billion by 2015*, InvestorPlace. Available from: <http://investorplace.com/2012/04/the-apple-effect-and-protective-cases-aapl-ssnlf-goog/> [Accessed 18 Oct 2012].

Read, Herbert (1955). *English Prose Style*, Beacon.

Russell, Jon (2011). *Asia now world's biggest smartphone market*. Available from: <http://www.techwireasia.com/1221/asia-now-worlds-biggest-smartphone-market/> [Accessed 13 April 2012].

Vihma, Susann (1995). *Products as representations*, Publication series of the University of Art and Design Helsinki UIAH A 14.

Yap, Jamie (2011). *Asian smartphone market to double by 2016*. Available from: <http://www.zdnet.com/asian-smartphone-market-to-double-by-2016-2062208011/> [Accessed 13 April 2012].

Zonana, Victor F. (1988). *IBM Gets Stake in Metaphor to Enhance Its PCs*. LA Times. Available from: [http://articles.latimes.com/1988-04-19/business/fi-1256\\_1\\_metaphor-system](http://articles.latimes.com/1988-04-19/business/fi-1256_1_metaphor-system) [Accessed 12 August 2012].

